

Gonorrhea

Infections due to *Neisseria gonorrhoeae*, like those resulting from *Chlamydia trachomatis*, are a major cause of pelvic inflammatory disease (PID) in the United States. Occurrence of PID can lead to serious outcomes such as tubal infertility, ectopic pregnancy, and chronic pelvic pain. In addition, epidemiologic and biologic studies provide strong evidence that gonococcal infections facilitate the transmission of HIV infection.¹

Following a 73.8% decline in the reported rate of gonorrhea from 1975 to 1997, in 1998 the gonorrhea rate increased by 7.8% and has remained essentially unchanged through 2001 (Figure 9 and Table 1). Although increased screening (usually associated with simultaneous testing for chlamydial infection), use of more sensitive diagnostic tests, and improved reporting may account for a portion of the recent increase, true increases in disease in some populations and geographic areas also appear to have occurred.²

As with reporting of chlamydial infection, reporting of gonorrhea cases to CDC is incomplete. In addition, reporting practices for gonococcal infections may have been biased towards reporting of infections in persons of minority race or ethnicity, who are more likely to attend public STD clinics.^{2,3} As a result, for most areas, the number of gonorrhea cases reported to CDC are affected by many factors, only one of which is the occurrence of the infection within the population. For this reason, new data on gonorrhea prevalence in persons screened in a variety of different settings are useful in assessing disease burden in selected populations.

- In 2001, 361,705 cases of gonorrhea were reported in the United States (Table 1).
- The rate of reported gonorrhea in the United States was 128.5 cases per 100,000 population in 2001 which was similar to the rates for the previous three years (129.0 in 2000, 132.3 in 1999, and 131.9 in 1998) (Table 14). In the period from 1975 to 1997, the national gonorrhea rate had been generally declining following the implementation of the national gonorrhea control program in the mid-1970s (Table 1).
- In 2001, eight states and one outlying area reported gonorrhea rates below the Healthy People 2010 (HP2010) national objective of 19 cases per 100,000 population⁴ (Figure 10 and Table 13).
- Between 2000 and 2001, the gonorrhea rates in two of the four Census regions of the United States (Northeast and West) increased while the rates decreased slightly in the other two regions (Midwest and South). The Northeast experienced a 9.6% increase in rates (from 89.3 per 100,000 population in 2000 to 97.9 in 2001) and the West experienced a 7.0% increase (from 57.5 per 100,000 in 2000 to 61.5 in 2001). Meanwhile, the gonorrhea rate in the Midwest decreased by 1.7% (from 145.9 per 100,000 in 2000 to 143.4 in 2001) and the South had a 3.9% decrease in rates (from 184.6 cases per 100,000 population in 2000 to 177.5 in 2001). As in previous reporting years, the South had the highest reported gonorrhea rate in 2001 among the four regions of the country (Figure 11, Table 14).

- The reported gonorrhea rate among women in 2001 (128.2 cases per 100,000 females) was similar to the rate in previous years (126.7 in 2000 and 128.6 in 1999) (Figure 12 and Table 15). The gonorrhea rate among men has declined in the last two years from 135.5 cases per 100,000 males in 1999 to 130.9 in 2000 and to 128.4 in 2001 (Figure 12 and Table 16).
- State-specific reported gonorrhea rates for men and women were higher than the HP2010 objective of 19 cases per 100,000 population in 42 states and two outlying areas (Tables 15 and 16).
- The overall gonorrhea rate reported from selected large cities with populations over 200,000 persons was 227.4 cases per 100,000 population in 2001. This rate is similar to what was reported for these cities in 2000 (231.2 cases per 100,000 population) (Table 18). All of these 63 cities and one outlying area, had reported rates higher than the HP2010 objective of 19 cases per 100,000 population (Table 17).
- Changes in the reported 2001 gonorrhea rates, relative to those reported in 2000, differed depending on racial/ethnic group. Gonorrhea rates increased in 2001 for three of the five racial/ethnic groups. The rates among Hispanics (69.4 per 100,000 in 2000 and 74.2 in 2001) and among non-Hispanic whites (27.7 in 2000 and 29.4 in 2001) increased by 6.9% and 6.1% respectively between 2000 and 2001. The gonorrhea rate among Asian/Pacific Islanders declined in 2001 compared to 2000 (from 27.8 down to 26.7) but remained elevated compared to previous years (20.9 in 1999). The rate among African-Americans declined by 0.7% from 788.2 in 2000 to 782.3 in 2001 which was less than the declines in previous years (from 859.4 in 1998 to 848.3 in 1999 to 788.2 in 2000) (Figure 13 and Table 22B). In 2001, the reported gonorrhea rate among African-Americans was about 27 times greater than the rate for non-Hispanic whites. The 2001 gonorrhea rates for all racial/ethnic groups were above the HP2010 objective of 19 per 100,000 population.
- Among women in 2001, 15- to 19-year-olds had the highest reported rate of gonorrhea (703.2 per 100,000), while among men, 20- to 24-year-olds had the highest rate (563.6 per 100,000) (Figure 14 and Table 21).
- In 2001, the median state-specific gonorrhea test positivity among 15- to 24-year-old women screened in selected family planning clinics in 34 states, Puerto Rico, District of Columbia, and the Virgin Islands was 1.0% (range 0.1% to 3.2%) (Figure 15). In other settings, gonorrhea test positivity has been much higher. See **Special Focus Profiles**.
- Antimicrobial resistance remains an important consideration in the treatment of gonorrhea.^{5,6} Overall, 20.9% of isolates collected in 2001 by the Gonococcal Isolate Surveillance Project (GISP) were resistant to penicillin, tetracycline, or both (Figures 16 and 17).
- Resistance to ciprofloxacin was first identified in GISP in 1991. From 1991 to 1998, fewer than 9 ciprofloxacin-resistant isolates were identified each year and such isolates were identified in only a few GISP clinics. In 2000, similar to 1999, 19 (0.4%) ciprofloxacin-resistant GISP isolates were identified in 7 of the 25 GISP clinics. In 2001, 38 (0.7%) ciprofloxacin-resistant GISP isolates were identified in 6 clinics (Figure 18). Notably, in Honolulu, the proportion of GISP isolates that were resistant to ciprofloxacin continued to increase quite markedly and was

20.3% in 2001, compared to 14.3% in 2000. This ongoing trend reinforces the recommendation made by CDC in 2000 that fluoroquinolones not be used to treat gonorrhea acquired in Hawaii.⁵ In 2001, elevated proportions of GISP isolates resistant to ciprofloxacin were identified in all four California GISP sites (3.0% in Long Beach, 2.3% in Orange County, 2.1% in San Diego, and 3.4% in San Francisco); as a result, in 2002, the California STD Program recommended that fluoroquinolones no longer be used for gonorrhea treatment in California.

- In 2001, four (0.1%) GISP isolates had decreased susceptibility to cefixime; no GISP isolates had decreased susceptibility to ceftriaxone. The proportion of GISP isolates demonstrating decreased susceptibility to ceftriaxone or cefixime has remained very low over time. To date, cephalosporin resistance has not been identified in GISP. However, it was notable that three of the four isolates with decreased susceptibility to cefixime were also resistant to penicillin, tetracycline, and ciprofloxacin; such multi-drug resistance in combination with decreased susceptibility to cefixime has rarely been identified in the United States.⁷
- The proportion of GISP isolates demonstrating elevated minimum inhibitory concentrations (MICs) to azithromycin has been increasing since GISP began monitoring azithromycin susceptibility in 1992. In 1992, 0.9% of GISP isolates had azithromycin MIC ≥ 0.5 mg/ml compared with 1.5% in 2001. In 1992, there were no isolates with azithromycin MIC ≥ 1.0 mg/ml but in 2001, there were 15 such isolates.
- From GISP data, the percentage of men with gonorrhea who were reported to have had a gonorrhea infection in the previous year has remained essentially unchanged between 1992 (21.5%) and 2001 (22.0%) (Figure 19).
- Additional information about gonorrhea in racial and ethnic minority populations, adolescents, men who have sex with men, and other at risk populations can be found in the **Special Focus Profiles**.

¹ Cohen MS, Hoffman IF, Royce RA, et al. Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. *Lancet* 1997;349:1868-73.

² Centers for Disease Control and Prevention. Gonorrhea – United States, 1998. *MMWR* 2000;49:538-42.

³ Fox KK, Whittington W, Levine WC, Moran JS, Zaidi AA, Nakashima AN. Gonorrhea in the United States, 1981-1996: demographic and geographic trends. *Sex Transm Dis* 1998;25(7):386-93.

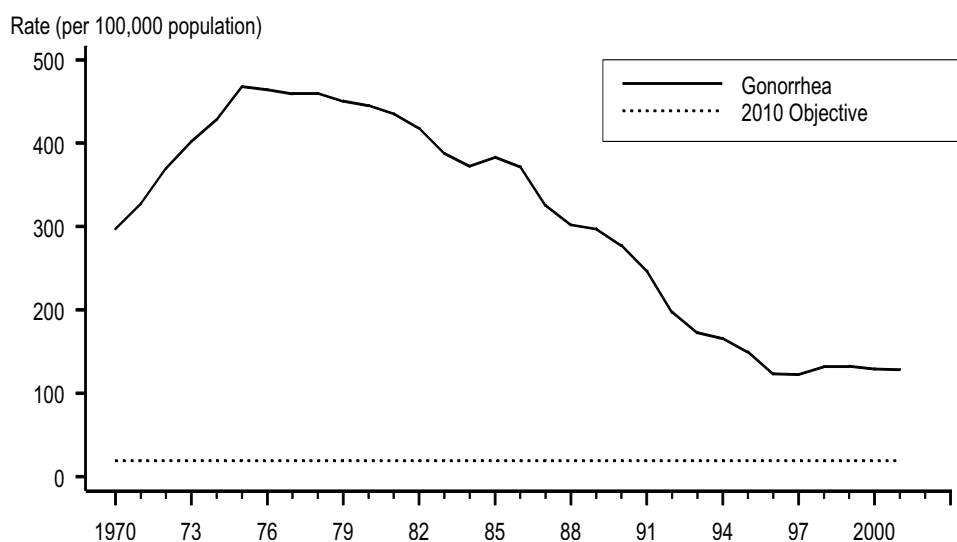
⁴ U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

⁵ Centers for Disease Control and Prevention. Fluoroquinolone-resistance in *Neisseria gonorrhoeae*, Hawaii, 1999, and decreased susceptibility to azithromycin in *N. gonorrhoeae*, Missouri, 1999. *MMWR* 2000;49:833-837.

⁶ Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2001 Supplement: Gonococcal Isolate Surveillance Project (GISP) Annual Report 2001*. Atlanta, GA: U.S. Department of Health and Human Services (in press).

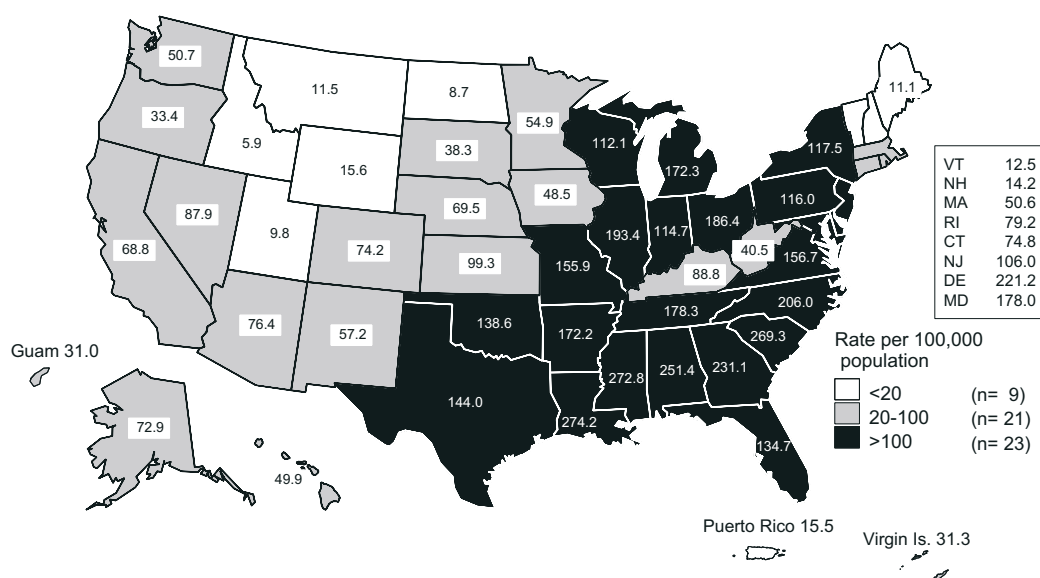
⁷ Wang SA, Lee MV, Iverson CJ, O'Connor N, Ohye RG, Hale JA, Knapp JS, Effler PV, Weinstock HS. Multi-drug resistant *Neisseria gonorrhoeae* with decreased susceptibility to cefixime, Hawaii, 2001. [Abstract] International Conference on Emerging Infectious Diseases, Atlanta, Georgia, March 25, 2002.

Figure 9. Gonorrhea — Reported rates: United States, 1970–2001 and the Healthy People year 2010 objective



Note: The Healthy People 2010 (HP2010) objective for gonorrhea is 19.0 cases per 100,000 population.

Figure 10. Gonorrhea — Rates by state: United States and outlying areas, 2001



Note: The total rate of gonorrhea for the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 126.9 per 100,000 population. The Healthy People year 2010 objective is 19.0 per 100,000 population.

Figure 11. Gonorrhea — Rates by region: United States, 1981–2001 and the Healthy People year 2010 objective

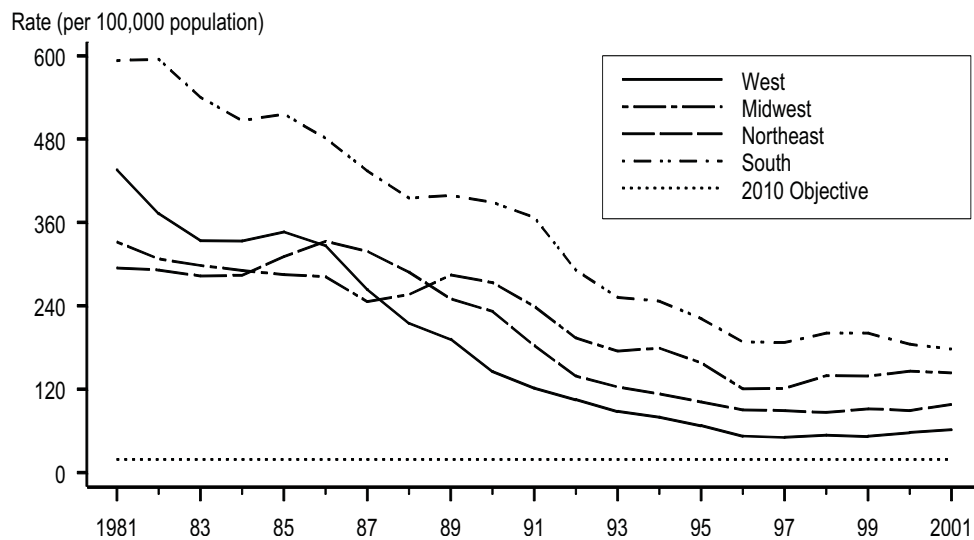


Figure 12. Gonorrhea — Rates by sex: United States, 1981–2001 and the Healthy People year 2010 objective

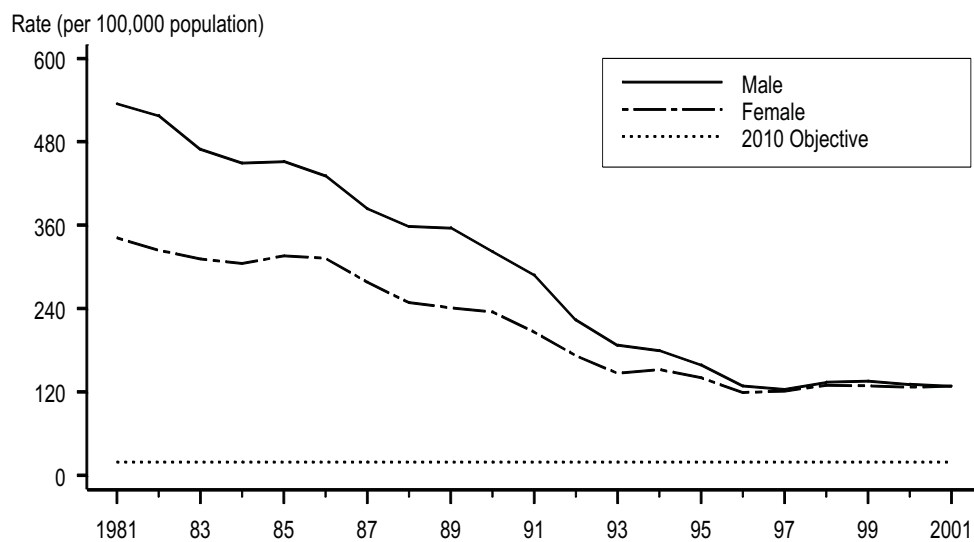


Figure 13. Gonorrhea — Rates by race and ethnicity: United States, 1981–2001 and the Healthy People year 2010 objective

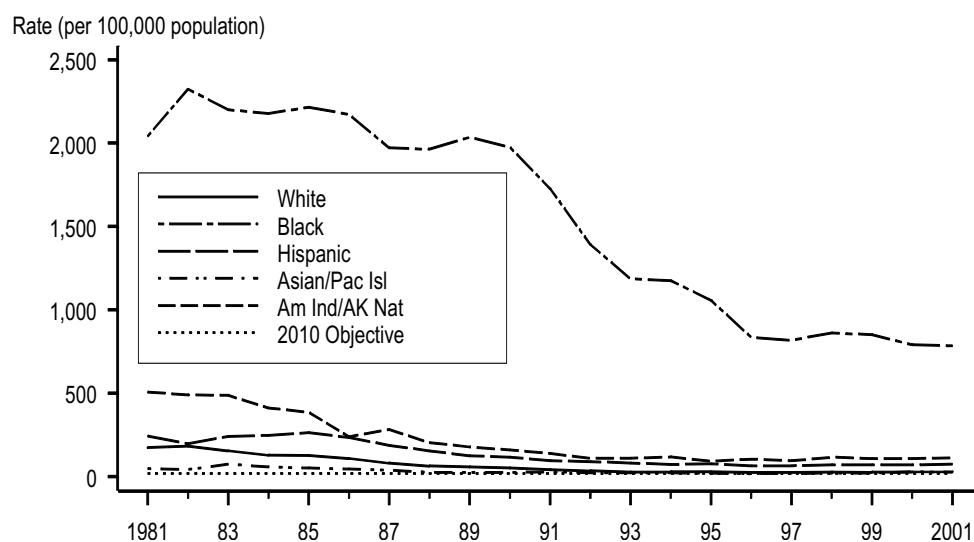
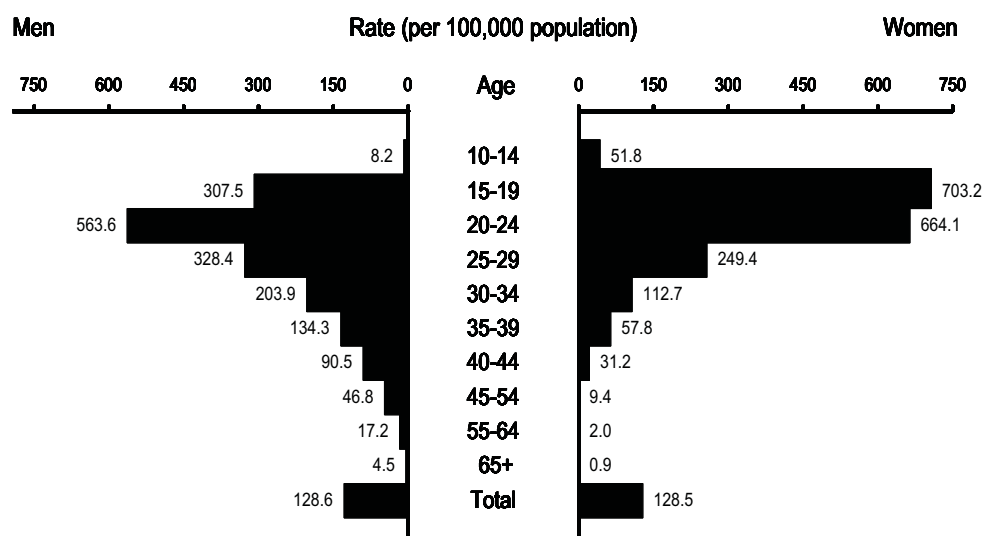
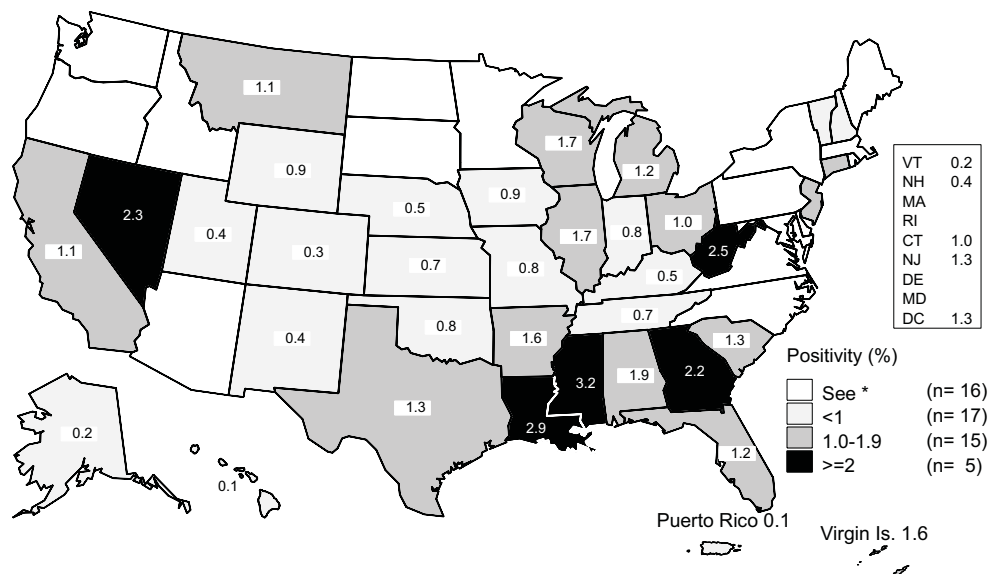


Figure 14. Gonorrhea — Age- and sex-specific rates: United States, 2001



Note: See Table 21 and Appendix for more information.

Figure 15. Gonorrhea — Positivity among 15-24 year old women tested in family planning clinics by state: United States and outlying areas, 2001



*States reported gonorrhea positivity data on less than 500 women aged 15-24 years during 2001.

SOURCE: Regional Infertility Prevention Program; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

Figure 16. Gonococcal Isolate Surveillance Project (GISP) — Location of participating clinics and regional laboratories: United States, 2001

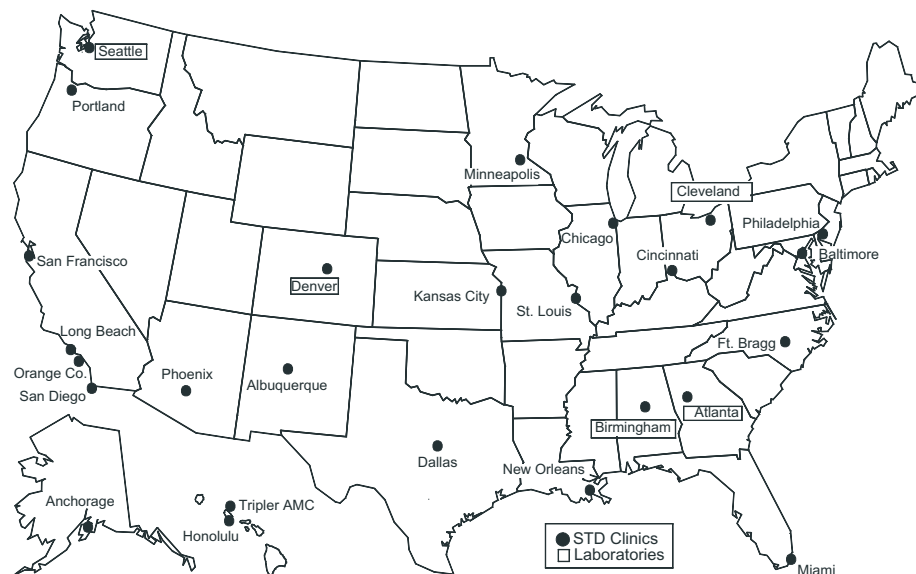
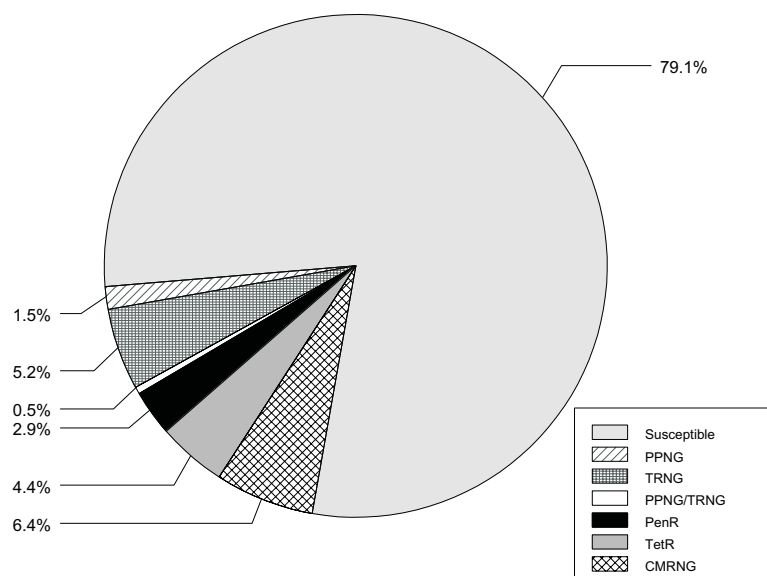
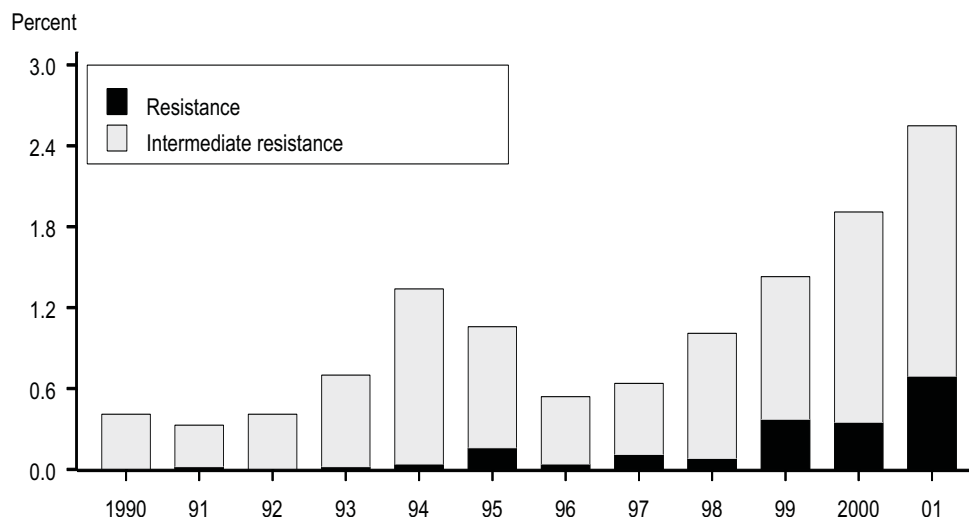


Figure 17. Gonococcal Isolate Surveillance Project (GISP) — Penicillin and tetracycline resistance among GISP isolates, 2001



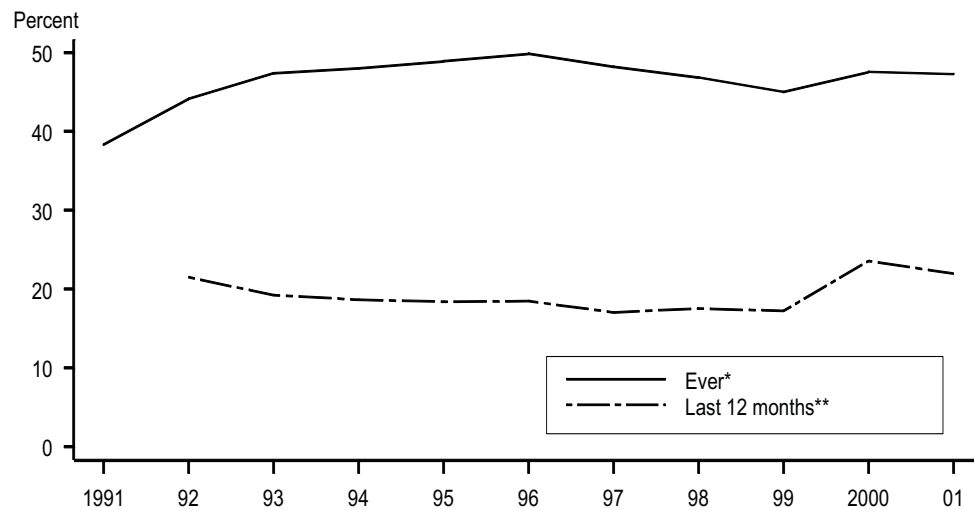
Note: PPNG=penicillinase-producing *N. gonorrhoeae*; TRNG=plasmid-mediated tetracycline resistant *N. gonorrhoeae*; PPNG-TRNG=plasmid-mediated penicillin and tetracycline resistant *N. gonorrhoeae*; PenR=chromosomally mediated penicillin resistant *N. gonorrhoeae*; TetR=chromosomally mediated tetracycline resistant *N. gonorrhoeae*; CMRNG=chromosomally mediated penicillin and tetracycline resistant *N. gonorrhoeae*.

Figure 18. Gonococcal Isolate Surveillance Project (GISP) — Percent of *Neisseria gonorrhoeae* isolates with resistance or intermediate resistance to ciprofloxacin, 1990–2001



Note: Resistant isolates have ciprofloxacin MICs ≥ 1 $\mu\text{g/mL}$. Isolates with intermediate resistance have ciprofloxacin MICs of 0.125 - 0.5 $\mu\text{g/mL}$. Susceptibility to ciprofloxacin was first measured in GISP in 1990.

Figure 19. Gonococcal Isolate Surveillance Project (GISP) — Percent of men with gonorrhea who had a previous gonorrhea infection, 1991–2001



*Data first collected in 1991.

**Data first collected in 1992.

